MISSOURI DEPARTMENT OF TRANSPORTATION
MATERIALS ENGINEERING
Jefferson City, Missouri

Test Method
MoDOT T29
DETERMINATION OF NITROGEN IN LIQUID FERTILIZERS

1.0 SCOPE

This method describes a procedure for determining the percent Nitrogen in liquid fertilizers

2.0 REAGENTS

(a) 0.1 Normal Sodium Hydroxide Solution.

Dissolve 4 gm NaOH, Reagent Grade, in H_2O and dilute to 1000 ml. Standardize against Reagent Grade Potassium Acid Phthalate.

(b) 0.1 Normal Sulfuric Acid Solution.

Dilute 3 ml H_2SO_4 Reagent Grade to 1000 ml. Standardize against the 0.1 N NaOH.

(c) Sodium Sulfide Solution.

Dissolve 4 gm Na_2S, Reagent Grade in 100 ml H_2O.

(d) Sodium Hydroxide Solution.

Dissolve 500 gm NaOH, Reagent Grade in 1000 ml H_2O.

3.0 PROCEDURE

Weigh, to the nearest 0.1 mg, 3-3.5 gr of the sample from a dropping bottle into a 500 ml volumetric flask. Dilute to volume and pipette 50 ml into an 800 ml Kjeldahl flask. Add 5 gm of finely powdered reduced Iron and 60 ml of H_2SO_4 (1-1). Swirl the flask to mix the contents and let stand until visible reaction ceases. Digest over low heat for 5-10 minutes, then add 0.7 gm HgO, Reagent Grade. Continue the digestion until most of the liquid is gone and the contents cling to the sides of the flask. Cool, add about 300 ml H_2O, and cool to room temperature. Add about 0.5 gm of granular Zinc and 25 ml of

Na_2S solution. Pipette 50 ml of 0.1 N H_2SO_4 into a 400 ml beaker and place the beaker under a condenser so that the tip of the condenser extends below the surface of the acid. Tilt the flask, slowly add 100 ml of NaOH solution, and immediately connect the flask to the condenser by means of a Kjeldahl connecting bulb. Distill until 150-200 ml has been collected in the beaker. Titrate the excess acid with 0.1 N NaOH solution, using Methyl Red as the indicator.

4.0 CALCULATIONS

Adjust the volumes of the H_2SO_4 and NaOH solutions to exactly 0.1000 Normal, and make the following calculations:

$$\% N = \frac{(ml\ 0.1\ N\ H2SO4 - ml\ 0.1\ N\ NaOH) \times 0.014}{\text{Weight of Sample}} \times 100$$

Report as:

% Nitrogen (N)